

CLAIMS

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BL 1. A method for backing up a computer-readable object stored on a first logical device unit, the method comprising:

when the object is not currently mirrored to a mass storage device, creating a mirror for the object on a second logical device unit on a mass storage device;

when the object and the mirror for the object are split, resyncing the object with the mirror for the object;

splitting the object and the mirror for the object so that the mirror becomes a backup copy of the object and so that I/O requests directed to the object are not automatically directed to the mirror;

retrieving a current timestamp from the second logical device and saving it as a saved timestamp;

updating the timestamp upon executing any I/O operation directed to the second logical device that alters data stored on the second logical device;

when the object is determined to need to be restored from the mirror,

retrieving a current timestamp from the second logical device;

comparing the retrieved current timestamp to the saved timestamp;

when the current timestamp is equal to the saved timestamp, copying the mirror to the first logical device to replace or again create the object on the first logical device.

2. The method of claim 1 further including copying the object to a second backup copy on a difficult-to-modify mass storage device after splitting the object and the mirror for the object.

3. The method of claim 2 further including, when the current timestamp is not equal to the saved timestamp, copying the second backup copy from the difficult-to-modify mass storage device to the first logical device to replace or again create the object on the first logical device.

4. The method of claim 3 wherein the mass storage device is one or more hard disk drives and the difficult-to-modify mass storage device is a tape drive.

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6. The method of claim 1 further including, prior to retrieving a current timestamp from the second logical device and saving it as a saved timestamp, enabling timestamping on the second logical device unit, and wherein the timestamp is updated upon executing any I/O operation directed to the second logical device that alters data stored on the second logical device only when timestamping is enabled on the second logical device unit.

when the object is not currently mirrored to a mass storage device, creating a mirror for the object on a second logical device unit on a mass storage device;

splitting the object and the mirror for the object so that the mirror becomes a backup copy of the object and so that I/O requests directed to the object are not automatically directed to the mirror;

incrementing the count ~~executing any I/O operation directed to the second logical device~~

when the object is determined to need to be restored from the mirror,

comparing the retrieved current count to the saved count;

when the current count is equal to the saved count, copying the mirror to the first logical device to replace or again create the object on the first logical device.

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14. The mass storage device of claim 13 wherein the controller updates the current state metric for a logical device unit whenever the controller executes an I/O operation that changes the data, stored on the medium for storing data, included in the logical device unit's data.

16. The mass storage device of claim 13 wherein the current state metric is a timestamp.

18. The mass storage device of claim 13 wherein the current state metric is a counter.

19. The mass storage device of claim 16 wherein the controller updates the counter by incrementing the counter.